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## FEEDING NOTES ON THE WHITE-TAILED BLACK COCKATOO

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The feeding of these Cockatoos (*Calyptorhynchus baudini*) on the pupae of a braconid wasp which inhabits the galls on *Banksia attenuata* I do not think has been previously recorded. *B. attenuata* grows profusely in the higher sandy country at Coolup in conjunction with Marri (*Eucalyptus calophylla*) and Jarrah (*E. marginata*). Many trees of *B. attenuata* reach a height of over 40 ft. *B. attenuata* flowers in November with a long yellow spike similar to that of *B. littoralis*, which is found in the same area but grows in low wet patches and flowers in March. *B. attenuata* varies considerably from year to year in the amount of blossom—1963 was very good but 1962 was very poor. Some years it suffers from the attacks of insects which cause galls, up to 18 in. long and 1 in. in diameter, along the stems. These galls can be so numerous in some seasons as to cause the death of the tree. Though in 1962 these banksias were badly infested by galls there is evidence on dead trees on my farm of much greater infestation formerly. The gall infestation probably has some effect on the flowering, as in 1962 new galls were numerous.

On November 3, 1962, I found a flock of Black Cockatoos sitting on the top of the banksias tearing to pieces the galls just below the leaf spike. The ground underneath was littered with leaf spikes and bits of gall. Some of these galls were collected. It was found that there were many kidney-shaped cavities at right angles to the stem with the outer edge just under the bark. These cavities contained small pupae of a greyish white colour with black eye dots. Some of these pupae enclosed in pieces of gall were put in a sealed envelope and others in preservative.

On November 17, 1962, the sealed envelope was opened. The only active living things seen were two very small black wasps. At this stage the pupae showed no sign of emerging and the cockatoos were still spending much time dissecting the galls.

Mr. L. E. Koeh, of the W.A. Museum, identified the very small black wasps as a gall-producing species of the Cynipidae and the brown wasp pupae as a parasitic species of the Braconidae.

Over the next two weeks the galls dropped by the cockatoos were examined. On November 30 the braconid adults were emerging. They were brown with long antennae and long tail spike or ovipositor—not like the small black cynipid wasps.

At this stage the cockatoos began to lose interest in the galls and eventually left the locality, having spent five or six weeks feeding on the braconid pupae.

It was obvious by examination of many galls that the braconid wasps were now the main tenants. No pupae of the cynipids were ever seen.

It would appear that once the cockatoos chop off the galls there is little chance of the braconid pupae hatching out. The galls dry out quickly and tend to go mouldy. None of the pupae collected on November 3 reached maturity but the first galls picked up on November 30 were full of adult insects almost ready to fly. These wasps emerge through small round holes made through the bark.

During the period of the cockatoos' visit the flock ranged from 20 to 50 birds. Observations appeared to confirm that during the night they all roosted together but during the day they were divided into two parties. A feeding flock of adult birds fed on the braconid pupae and another smaller flock composed of young birds—recognised by their calls—with one or two adults, were found in a tall heavy-foliaged Marri some distance away.

An adult gave warning cries at my approach. This would appear to be a nursery flock which relied on the adults to procure their food.

In 1963 I expected to be able to confirm the 1962 observations but few galls appeared and they were very small. On November 25, 1963, I procured a small gall, which when opened up showed a number of minute light green larvae probably of the cynipid. I procured another two or three small new galls over the next few weeks with similar larvae. They were so small that I could only just identify them as a grub with an eye lens. I did not find any pupae. No cockatoos were seen as feeding flocks during the period.

These cockatoos are noted for the way they tear off the bark of dead or dying trees to get the larvae of a longicorn beetle (Cerambycidae). Though I have a number of Jarrahs affected by these larvae, only once in 27 years have I found the birds feeding on these grubs.

## FROM FIELD AND STUDY

**Kelp Gull at Esperance.**—During a visit to Esperance on April 16, 1964, I noted that Pacific Gulls (*Larus pacificus*) were numerous in that locality. While watching some of the gulls in flight I observed one, similarly marked but with an entirely white tail in contrast to the tail-pattern of the Pacific Gulls with their prominent black sub-terminal bands. I was unacquainted with the Kelp Gull (*L. dominicanus*) at the time but the difference in the tail markings was recorded for further enquiry. Further investigations indicated that the white-tailed bird seen with the Pacific Gulls was undoubtedly a Kelp Gull, a species only recently added to the Western Australian list, when single birds were seen at Middleton Beach, Albany, in October, 1963, and at Jurien Bay, 125 miles north of Perth, on February 5, 1964 (*W. Aust. Nat.*, 9: 86).

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